Danner, Ward

From: Thomas, Kent
Sent: Friday, June 27, 2014 12:05 PM
To: Jennifer DENICOLA
Cc: Armann, Steve
Subject: RE: Southern California Presentation on PCBs

Follow Up Flag: Follow up
Flag Status: Completed

Categories: Green Category

Dear Ms. DeNicola:

I have forwarded your message to U.S. EPA Region 9 for appropriate response. Please send future requests for information to Mr. Steve Armann in Region 9.

Best wishes,
Kent Thomas

U.S. EPA
National Exposure Research Laboratory
MD E205-04
Research Triangle Park, NC 27711

From: Jennifer DENICOLA [mailto:jd18@me.com]
Sent: Friday, June 20, 2014 4:41 AM
To: Thomas, Kent
Subject: Fwd: Southern California Presentation on PCBs

Dear Kent,

Thank you again for sharing your knowledge and experience with me. These questions relate to the ORD's scientific research and expertise.

1. First, I have asked for this information before, but have not received: Would you please give me the contact information for EPA Dr. Lehmann.

2. What is the PPM in caulking that the ORD believes that poses a health risk to students, based on EPA research?

3. What were the highest levels of caulking found in your EPA school study?

4. Did high air testing in the rooms with high PCBs in caulking co-relate to one another in your studies (rooms without PCB light ballasts?) and if so, what level (ppm) related to air testing?

Thank you again for your time. These are questions that relate to the ORD and not to Region 9.

Respectfully,

Jennifer deNicola

Begin forwarded message:

From: Jennifer DENICOLA <jd18@me.com>
Subject: Re: Southern California Presentation on PCBs
Date: June 6, 2014 at 7:44:42 AM PDT
To: "Thomas, Kent" <thomas.kent@epa.gov>

Kent,

Would you please provide me EPA, Dr. Lehmann email contact.

I think the question surrounding your experience with encapsulation can be best answered by you.

Region 9 has no/ little PCB experience in schools as they tell is we are the first in the west coast. You have done 6 test schools and are the contact to which region 9 sent me to :)

Please give these questions your best shot

Thank you,

Jennifer deNicola
Malibu Unites
www.MalibuUnites.com
Sign Our Petition to Remove Toxicants from Schools
http://goo.gl/sKR30F

On Jun 5, 2014, at 1:48 PM, "Thomas, Kent" <thomas.kent@epa.gov> wrote:

> Dear Ms. deNicola:
>
> I appreciate your continued interest in this topic with your questions below and request for a telephone discussion. Your questions are beyond what I am able to say based on my knowledge of the research performed in EPA's Office of Research and Development and my areas of expertise. I think that your questions about best management practices and monitoring requirements could best be answered by staff in the EPA Region 9 office. Region 9 can also work with appropriate EPA personnel to answer questions related to PCB health effects.
>
> With best wishes,
> Kent Thomas
>
> U.S. EPA
> National Exposure Research Laboratory
> MD E205-04
> Research Triangle Park, NC 27711

From: Jennifer DENICOLA [mailto:jd18@me.com]
Sent: Thursday, June 05, 2014 12:29 PM
To: Thomas, Kent
Subject: Re: Southern California Presentation on PCBs

Dear Kent,

Thank you once again for the detailed answers. I so appreciate you sharing your expertise with me. I would find it fascinating to have a chance to speak to you in person regarding this topic, maybe someday:) So here are my follow up questions:

2. Do you know of any other EPA departments or other agencies that have done studies on the effectiveness of BMP?

Without scientific evidence, what is your theory as to how BMP can be an effective tool to protect human (children's) health from PCB exposure? (other than it being good hygiene and should already be part of custodial staff daily job at schools :))

3. Encapsulation: Please describe the post-encapsulation monitoring requirements?

4. (new question) Were you on the "PCBs in schools part 2" webinar about Heath? If so, each expert spoke about the connections they have made to specific PCB's and disease. They are learning more and more and finding out that even low levels of exposure are harmful to human health especially with the additive and cumulative effects of pcbs and other chemical contaminants. The EPA, Dr. Lehmann, stated that, "We know less than we like to about dose response in terms of PCB inhalation. But we know enough about PCBs to know that inhaling them is probably not good. So I think that leaving them in place is probably not the course that we want to follow." She went on to state that the EPA has identified a level that they say with uncertainty, that they expect to be safe based on oral exposure studies, but even that is uncertain and inhalation does not have enough data. So how can the EPA be sure inhalation of PCBs at schools by children that are developing their bodies and brains is safe?

Thank you for your time and your expertise!

Respectfully,
Jennifer deNicola

Sent from my iPhone

On May 16, 2014, at 1:05 PM, "Thomas, Kent" <thomas.kent@epa.gov> wrote:

Dear Ms. deNicola:

I have copied your questions and request below, along with my responses.

1. Have you done any experiments with testing the caulking (sources) with a simple chlorine test first to determine if PCBs maybe present? I see it as an inexpensive screening that could tell if chlorine is present, then there may be PCBs but if no chlorine, then there should be no PCBs. If there is chlorine, further testing should occur to see levels. Please let me know if you have any experience with this idea. Does this idea have scientific merit and would you think it maybe something to look into as a screening method? Do you have any other ideas of inexpensive screening methods that may work to test sources like caulking?

EPA's Office of Research and Development has not investigated any simpler screening assessment methods for PCBs or chlorine in caulk. The only investigation of a simpler testing approach for chlorine in caulk that I have seen published in the scientific literature is:

Klosterhaus S, McKee LJ, Yee D, Kass JM, Wong A. Polychlorinated biphenyls in the exterior caulk of San Francisco Bay Area buildings, California, USA. Environment International 66:38-43, 2014.

The researchers analyzed caulk for PCBs using standard laboratory methods, and also analyzed some of the same caulk using an X-ray fluorescence (XRF) device. The XRF device was set up to see if it could measure chlorine as a surrogate for PCBs. Many of the laboratory and XRF chlorine measurements did not agree well and the XRF measurements often had very high detection limits.

2. "A common approach to assess effectiveness is to perform measurements both before and after implementing changes; for example, collecting surface wipe samples before and after cleaning to determine whether concentrations have been reduced below a targeted concentration. " After a good cleaning there should be very little dust left, but after a week, it is back on the surfaces, so how ofter did you test after the room was remediated and cleaned? 1 week later? 1 month later? 3 months, etc?

As part of EPA's Office of Research and Development research, no scientific measurement data were collected on the effectiveness of cleaning or how often it needs to be done.

3. remediation: I have been told that remediation of sources is for a short period of time and was given the example that for a school, it was until the next school break so that remediation could happen when kids were not present (of course :)) Is this accurate to what your findings? Encapsulation of window caulking is for a short time only because it is not effective? "Encapsulation was not found to be effective in reducing emissions from sources that have a high PCB content (for example caulk) for more than a short period of time. "

The EPA ORD report "Laboratory Study of Polychlorinated Biphenyl (PCB) Contamination and Mitigation in Buildings; Part 3. Evaluation of the Encapsulation Method" describes factors associated with the effectiveness of encapsulation. These included the type of encapsulant, encapsulant thickness, and the concentration of PCBs in

the material being encapsulated. Encapsulation was found to be most effective for interior surfaces that contain low levels of PCBs (i.e. several hundred parts per million or less). Depending on the PCB reduction goal, the performance of the encapsulant, and the conditions of the building, the upper limit of the PCB concentration for successful encapsulation may vary. Therefore, post-encapsulation monitoring is an essential part of the encapsulation process.

Best wishes,
Kent Thomas

U.S. EPA
National Exposure Research Laboratory
MD E205-04
Research Triangle Park, NC 27711

From: Jennifer DENICOLA [mailto:jd18@me.com]
Sent: Saturday, May 10, 2014 2:37 AM
To: Thomas, Kent
Subject: Re: Southern California Presentation on PCBs

Dear Kent:

Thank you for this very detailed reply. It helps me so much to understand what you have all learned from your school studies. I so appreciate you sharing this information with me!

I have some follow up questions, I kindly ask you to answer:

1. Have you done any experiments with testing the caulking (sources) with a simple chlorine test first to determine if PCBs maybe present? I see it as an inexpensive screening that could tell if chlorine is present, then there may be PCBs but if no chlorine, then there should be no PCBs. If there is chlorine, further testing should occur to see levels.

Please let me know if you have any experience with this idea.
Does this idea have scientific merit and would you think it maybe something to look into as a screening method?
Do you have any other ideas of inexpensive screening methods that may work to test sources like caulking?

2. "A common approach to assess effectiveness is to perform measurements both before and after implementing changes; for example, collecting surface wipe samples before and after cleaning to determine whether concentrations have been reduced below a targeted concentration. " After a good cleaning there should be very little dust left, but after a week, it is back on the surfaces, so how ofter did you test after the room was remediated and cleaned? 1 week later? 1 month later? 3 months, etc?

3. remediation: I have been told that remediation of sources is for a short period of time and was given the example that for a school, it was until the next school

break so that remediation could happen when kids were not present (of course :)) Is this accurate to what your findings? Encapsulation of window caulking is for a short time only because it is not effective? "Encapsulation was not found to be effective in reducing emissions from sources that have a high PCB content (for example caulk) for more than a short period of time. "

Once again, I thank you for your time and your expertise on this subject. I hope that you will get to do some test schools on the West coast to determine if the East coast results are consistent with schools in a different environment, with different building materials and different weather conditions. If you can, I hope you will test schools without light ballasts, so we can take this source out of the equation. Please keep me up to date on any findings you and your team come up with.

Warm Regards,
Jennifer deNicola
310-848-5400

On May 8, 2014, at 1:53 PM, Thomas, Kent <thomas.kent@epa.gov> wrote:

Dear Ms. deNicola:

Thank you again for your interest and request for information. I did have an opportunity to listen-in to the April 28 webinar. I have copied your questions and request below, along with my responses.

Question #1. I wanted to know if you have scientific data on Best Management Practices cleaning as recommended by the EPA on the website that proves its effectiveness and how often it needs to be done to be effective. In addition, how can one be sure that it is done effectively?

I will answer on behalf of my office, EPA's Office of Research and Development (ORD), with regard to the research that this office has conducted. As part of ORD's research, no scientific measurement data were collected on the effectiveness of cleaning, how often it needs to be done, and how to ensure it is done effectively for reduction in the potential for PCB exposures. However, ORD did use measurement data from several schools in an exposure model to estimate the potential for children's exposures from inhalation, dermal contact, and ingestion pathways (see link to ORD report below). The results indicate that exposures to PCBs in air and dust inside school buildings are likely to account for most of the exposure. The best management practices that EPA has recommended are intended to reduce exposures to PCBs from air and dust.

You asked how effectiveness of cleaning can be determined. A common approach to assess effectiveness is to perform measurements both before and after implementing changes; for example, collecting surface wipe samples before and after cleaning to determine whether concentrations have been reduced below a targeted concentration. Because there is uncertainty at this time in how often certain steps such as cleaning may be needed to keep concentrations below desired levels, additional measurements may be needed over time to evaluate

whether PCB concentrations are stable, increasing, or decreasing. The test interval(s) can be discussed with the Region PCB Coordinator.

Polychorinated Biphenyls (PCBs) in School Buildings: Sources, Environmental Levels, and Exposures. Thomas K, Xue J, Williams R, Jones P, and Whitaker D. U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Research Triangle Park, NC. EPA/600/R-12/051. September 2012. The report can be accessed and downloaded
from: http://www.epa.gov/pcbsincaulk/pdf/pcb_EPA600R12051_final.pdf

Question #2. My last question is about encapsulation. Do you have scientific data that supports encapsulation is effective?

Based on EPA's Office of Research and Development laboratory research, encapsulation was found to be most effective for interior surfaces that contain low levels of PCBs (i.e. several hundred parts per million or less). Depending on the PCB reduction goal, the performance of the encapsulant, and the conditions of the building, the upper limit of the PCB concentration for successful encapsulation may vary. Therefore, post-encapsulation monitoring is an essential part of the encapsulation process. Building owners should consult EPA's research on this issue for more specifics (see link to ORD report below). Encapsulation may be useful for the reduction of emissions from secondary sources such as contaminated building materials under and around PCB-containing caulk or paint that has been removed. Encapsulation was not found to be effective in reducing emissions from sources that have a high PCB content (for example caulk) for more than a short period of time. Because each site will present unique circumstances, it is recommended that building owners consult their EPA PCB Regional Coordinator regarding the application of encapsulation measures on a case by case basis.

Additional details about EPA's encapsulation research results and findings may be found in this report:
Laboratory Study of Polychlorinated Biphenyl (PCB) Contamination and Mitigation in Buildings; Part 3. Evaluation of the Encapsulation Method. Guo Z, Liu X, and Krebs K. U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Research Triangle Park, NC. EPA/600/R-11/156B. April 2012. The report can be accessed and downloaded following the link from this web site: http://www.epa.gov/pcbsincaulk/caulkresearch.htm

Request for Data. Would you please provide me with any data you have for both encapsulation and BMP.

I believe that all of the available supporting data and information as developed by EPA's Office of Research and Development is provided in the reports linked above.

With best wishes,
Kent Thomas

U.S. EPA
National Exposure Research Laboratory
MD E205-04
Research Triangle Park, NC 27711

From: Jennifer DENICOLA [mailto:jd18@me.com]
Sent: Wednesday, May 07, 2014 2:59 AM
To: Thomas, Kent
Subject: Re: Southern California Presentation on PCBs

Dear Kent:

I wanted to know if you have scientific data on Best Management Practices cleaning as recommended by the EPA on the website that proves its effectiveness and how often it needs to be done to be effective. In addition, how can one be sure that it is done effectively?

I attended the EPA webinar last week with EPA health experts and other experts the EPA gathered on PCB exposure in regards to human health. I hope you had an opportunity to listen in, it was insightful. I asked the experts a question which I have attached at the bottom of this email.

Based on the overall expert opinion, they are discovering more health concerns and relating it to individual congeners as well as over all PCB exposure. Each expert spoke about the additive effects of PCBs with other toxicants in our environment, thus making PCBs more dangerous to human health. The IARC just classified PCBs as group 1 carcinogens.

My last question is about encapsulation. Do you have scientific data that supports encapsulation is effective? Would you please provide me with any data you have for both encapsulation and BMP.

Thank you for your time and expertise.

Sincerely,
Jennifer deNicola

EPA Health Effects of PCBs Webinar: April 28th, 2014

The EPA gathered these three experts to make presentations to the entire US on the serious health affects of PCBs even at low levels. You can see these presentations on www.malibuunites.com/timeline and the March 28th date. Environ's plan calls for managing the PCBs in place, not testing for the PCB sources, relying only on one exposure pathway (inhalation) and ignoring the other exposure pathways (touch, ingestion etc), the experts were asked the following question:

Q: "Question from Jennifer deNicola: How do you feel about PCBs in schools? Do you think that we should leave PCBs in schools? Some people want to manage PCBs in place and continue to let them expose school age children, do you think this method will put children in potential harms way?"

Transcribed:

A: **EPA toxicologist, Dr. Geniece Lehmann**, said, "We know less than we like to about dose response in terms of PCB inhalation. But we know enough about PCBs to know that inhaling them is probably not good. ***So I think that leaving them in place is probably not the course that we want to follow.*** However to what extent they need to be remediated is the area of contention and that can only be answered if we know if we can identify a level that we think can be safe and right now **we have identified a level that we can say with uncertainty that we expect to be safe based on oral exposure studies but we would be able to have a lot more confidence in that data from inhalation studies**."

A: **Swedish EPA, Dr Johansson**, said, "If I can add to this. **I would certainly not recommend to leave PCBs in these buildings**. Because from our experience clearly that not only do they contaminate the indoor air but PCBs are escaping into the environment and they are there for considerable time and part of it will come back to us and prolong the exposure that we all have from PCBs. But the important thing is that **when it comes to human health risk assessment it's not based on the one exposure, not to be based on the indoor air or the inhalation (only) but because we are all exposed to contaminated food on top of indoor air and that accumulates** and we have different patterns for the composition of PCBs that we could be exposed to."

A: **University of Iowa Professor Department of Occupational and Environmental Health, Dr Ludewig,** said, "May I say something? PCB-52, 28, 101, 110: those are more of the neurotoxic ones and honestly when I see that there is PCB-95 (in schools) and that there is a correlation to autism and Parkinson's, I wonder why there is this increase in Autism in this society and **Alzheimer's** and other neurological diseases. I think we have to learn much much more before we can make an informed decision here. **Meantime we should just err on the side of caution and where it is possible**, like removing the light ballasts, is not such a big deal, so why not do it in the schools, when there are old ones with PCBs. **So remove the sources where it is possible and try and be as vigilant as possible, that's my attitude.** Especially also when you consider we are not only exposed to PCBs but then we have PBD's in our homes, food, the school exposure and that means we have mixtures and with respect to AH receptors, its additive…**So when we can remove an exposure somewhere or lower it, we should do that**."

-

On Apr 1, 2014, at 1:38 PM, Thomas, Kent <thomas.kent@epa.gov> wrote:

Dear Ms. deNicola:

Thank you for attending the presentation last week and for your interest on the topic. You have raised several good questions that I will try to answer:

You asked about Slide #25 showing modeled exposure estimates for the 6-10 year-old age groups by exposure pathway (inhalation, ingestion, dermal). First, it might be helpful if I briefly describe how we are doing the modeling. We used the wide range of PCB measurements in air, soil, and surface wipes from the six schools, along with the wide range of student/child activity information we have from other sources, and combined them through thousands of calculations (called simulations) to generate a range (distribution) of exposure estimates. We did not have dust measurements from all of the schools, so we used estimates of dust concentrations calculated from air concentrations and air/solid partitioning factors – so as to not miss that pathway, even though it introduced some additional uncertainty to the exposure estimates. We divided all of the estimates of exposure into ten groups, from the lowest 10 percent of the exposure estimates (0 percentile to 10^{th} percentile) to the highest 10 percent of the exposure estimates (90^{th} to 100^{th} percentile). The horizontal axis in the graph on Slide #25 shows the ten groups.

For each group, the graph shows the amount of each exposure estimate that came from different routes of exposure – inhalation, ingestion, and dermal contact. These model estimates suggest that, for most of the estimates for the 6 – 10 year old scenario, inhalation contributed most to the exposure (>70%). As you noticed, we see in the highest group of exposure estimates (the 90^{th} – 100^{th}percentile) the greatest contribution to the exposure estimates came from dust ingestion. This would happen when PCB concentrations in dust at the upper end of the concentration range get combined with assumptions about children engaged in activities with highest contact rates. Recognizing that there are uncertainties in any modeled estimates of exposure, we try to be very careful when we interpret these results because model estimates at the ends of the ranges tend to have larger uncertainties. In this case, part of our uncertainty is in dust exposures because the dust concentrations were estimated rather than measured. As you correctly observe, the exposure estimates in this modeling were based on concentrations from six schools; results might be different if other schools have different relative amounts of PCBs in air, dust, soil, and on surfaces.

We did our modeling using data from six schools in the northeastern U.S. As you correctly observed, we do not know if the PCB measurement results from these six schools are representative of older schools nationwide, either in terms of the presence of PCB-containing materials and components or the environmental concentrations measured in and around the school buildings. We included this as one of the study's important limitations in our research report. We did perform a separate exposure modeling analysis using data gathered from other reports of air, dust, soil, and surface PCB levels in other school and college buildings (shown in Appendix D of our research report). The exposure estimates were similar to those based on the six schools (pg 87, Table 4-36 in our research report). However, to the best of my knowledge, none of these other school buildings were in the western part of the U.S. As you noted, differences in temperature, ventilation, school construction and operations,

and other building factors might lead to different levels of PCBs in school environments in other parts of the country.

Dust may be an important route of exposure in some situations and cleaning to reduce dust will contribute to reducing exposures both from dust ingestion and inhalation of dust in the air. Your question about whether people in a school with more dust would have a larger exposure to PCBs from dust than from the air is interesting and also a bit complicated. All other things being equal, people in one school with higher amounts of dust on surfaces that people frequently contact than another school would likely get more exposure from dust. We also think that in many buildings there is likely to be a relationship between the concentration of PCBs in air and PCBs in dust. The relationship will depend on several factors, including how long the dust is exposed to the air, the composition of the dust, the temperature, and how much of the dust gets dispersed into the air through people's activities.

With regard to your question on recommendations for testing of air versus dust, the information we have collected and seen suggests that air sampling is likely to provide good overall information about the potential for exposures to PCBs. However, this information is based on measurements largely performed in schools in the northeastern U.S., and may be different in other locations and school buildings. Whether or not air testing is performed, dust removal and control as part of recommended best practices would quickly reduce the potential for exposures from dust.

Your final question is about whether PCB concentrations in air below public health recommendations at initial testing might increase over time without identification and removal of sources. Each site is different and the staff in EPA Region 9 are in the best position to answer such site specific questions about the appropriate type, frequency and duration of testing for PCBs in the air or other media. The regional staff has the necessary media measurements and other site information to inform such decisions and the expertise to do so.

Again, thank you for your interest on this topic.

Sincerely,
Kent Thomas

U.S. EPA
National Exposure Research Laboratory
MD E205-04
Research Triangle Park, NC 27711
(919) 541-7939.

From: Jennifer DENICOLA [mailto:jd18@me.com]
Sent: Friday, March 28, 2014 4:01 AM
To: Thomas, Kent

Cc: Paul Rosenfeld Ph.D.
Subject: Southern California Presentation on PCBs

Dear Kent Thomas:

My name is Jennifer deNicola and I attended your presentation last Tuesday in Los Angeles. I enjoyed your presentation. I have some follow up questions that I would like you to answer. I thank you in advance for you time.

Please look at page 25, what does the horizontal values mean: 90-100? Why does dust exposure grow as the percentile increases? It looks like dust is largest pathway in this last bar (90-100).

In addition, how can these 6 schools be a large enough sample study to draw conclusions for the entire country? The East Coast is not a good representation for the West Coast. On the West Coast we have schools that are indoor outdoor and the windows and doors are exposed to the outside elements, not an indoor hallway. Being by the ocean also brings added moisture in the air resulting in more dust. Lastly, a school that has more dust, should have a larger exposure to PCBs from the dust than the air.

Your last statement on this page says, "Dust ingestion may also be an important route of exposure in some situations," so if this is the case, and the location of the school is as described above on the West Coast, then why wouldn't dust testing be a more accurate test, than air testing alone, to see if there is a PCB problem?

I understand that health is affected by the exposure pathway, but if the EPA is only testing PCB secondary sources (air) and it does not exceed the EPA threshold and you not test and remove PCB primary sources (caulk), how would you know if in 6 months, 1 year or 5 years that exposure would not change and negatively affect health?

Once again, thank you for your assistance in answering my questions.

Sincerely,
Jennifer deNicola

Begin forwarded message:

From: Jennifer DENICOLA <jd18@me.com>
Subject: look at page 25, what does this mean 90-100 (looks like dust is largest pathway, but they say air
Date: March 27, 2014 at 11:49:05 PM PDT
To: "Paul Rosenfeld Ph.D." <rosenfeld.paul@gmail.com>

http://malibuunites.com/wp-content/uploads/2014/03/PCBs-in-Schools-Kent-Thomas-Presentation-03-25-14.pdf